

A photograph of two BMW motorcyclists racing on a track. The lead rider is in the foreground, wearing a white helmet and a blue and white racing suit, leaning into a turn on a blue and white BMW motorcycle. A second rider is visible behind and to the left. The background is a blurred racetrack and green grass. The title 'Motorcycle Safety' is overlaid in large white letters with a black outline.

# Motorcycle Safety

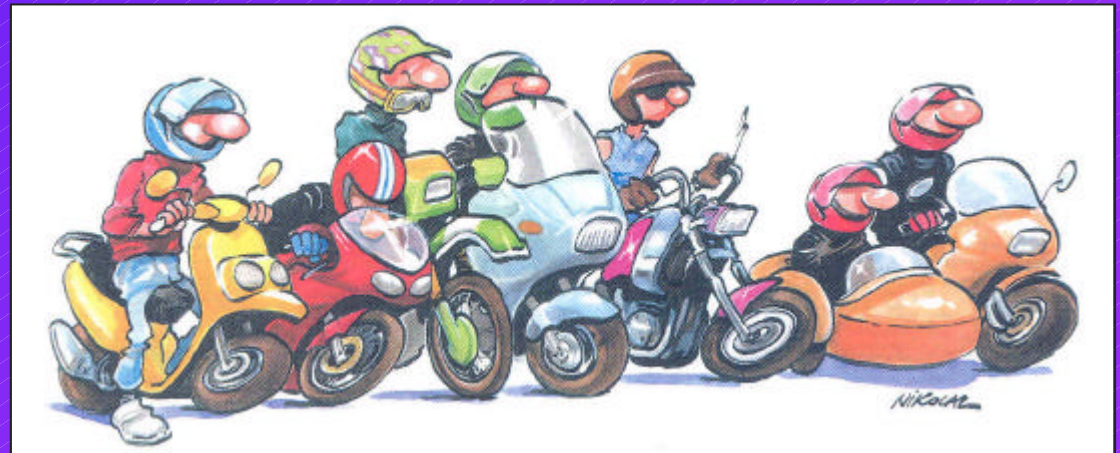
*Reiner Pfeifer BMW Motorrad  
April 2005*

# Agenda

- **Preliminary note**
- **Statistics**
- **ISO 13232**
- **Safety elements**
- **Research**

# Agenda

- Preliminary note
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- Safety elements
- Research





# Fascination Motorcycle



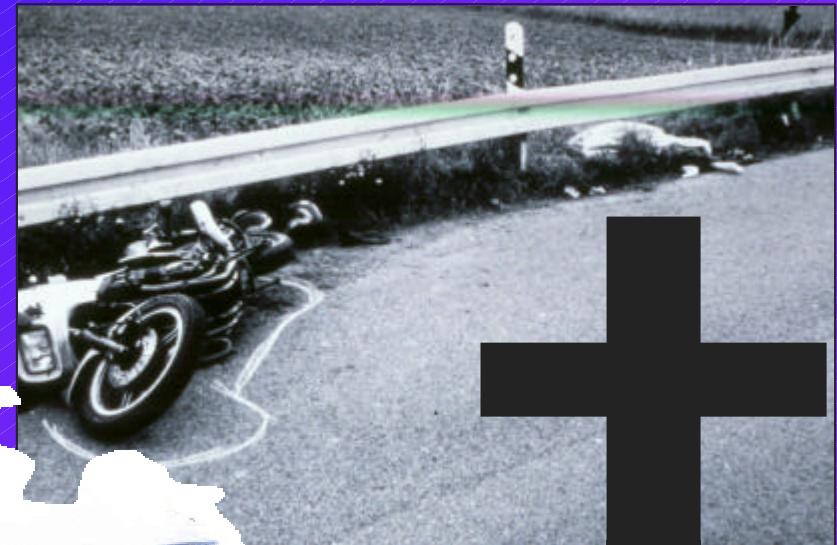


# Risks





# Risks



APPPI  
DU FELST  
MIE ASSO



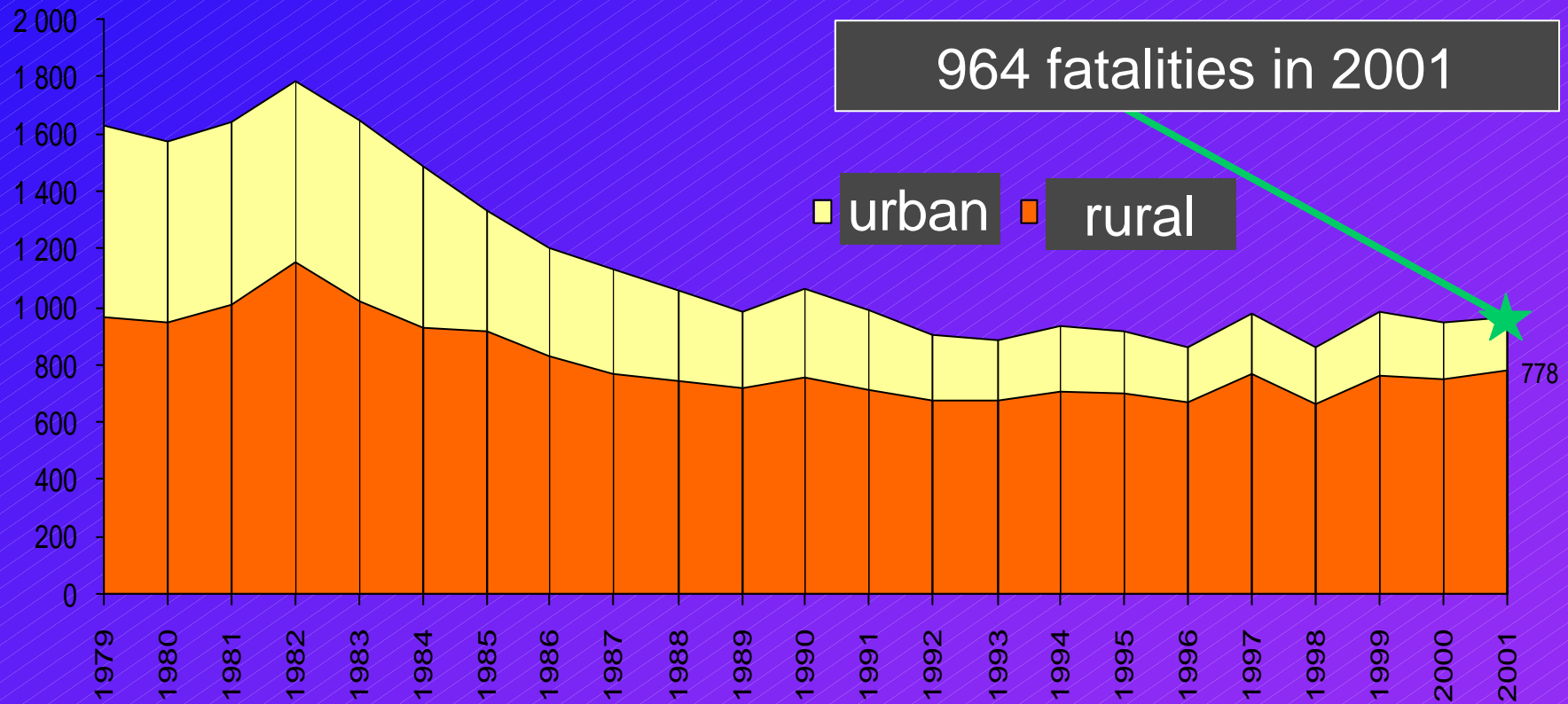
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# Statistics

## Killed Motorcycle Riders in Germany 1979-2001

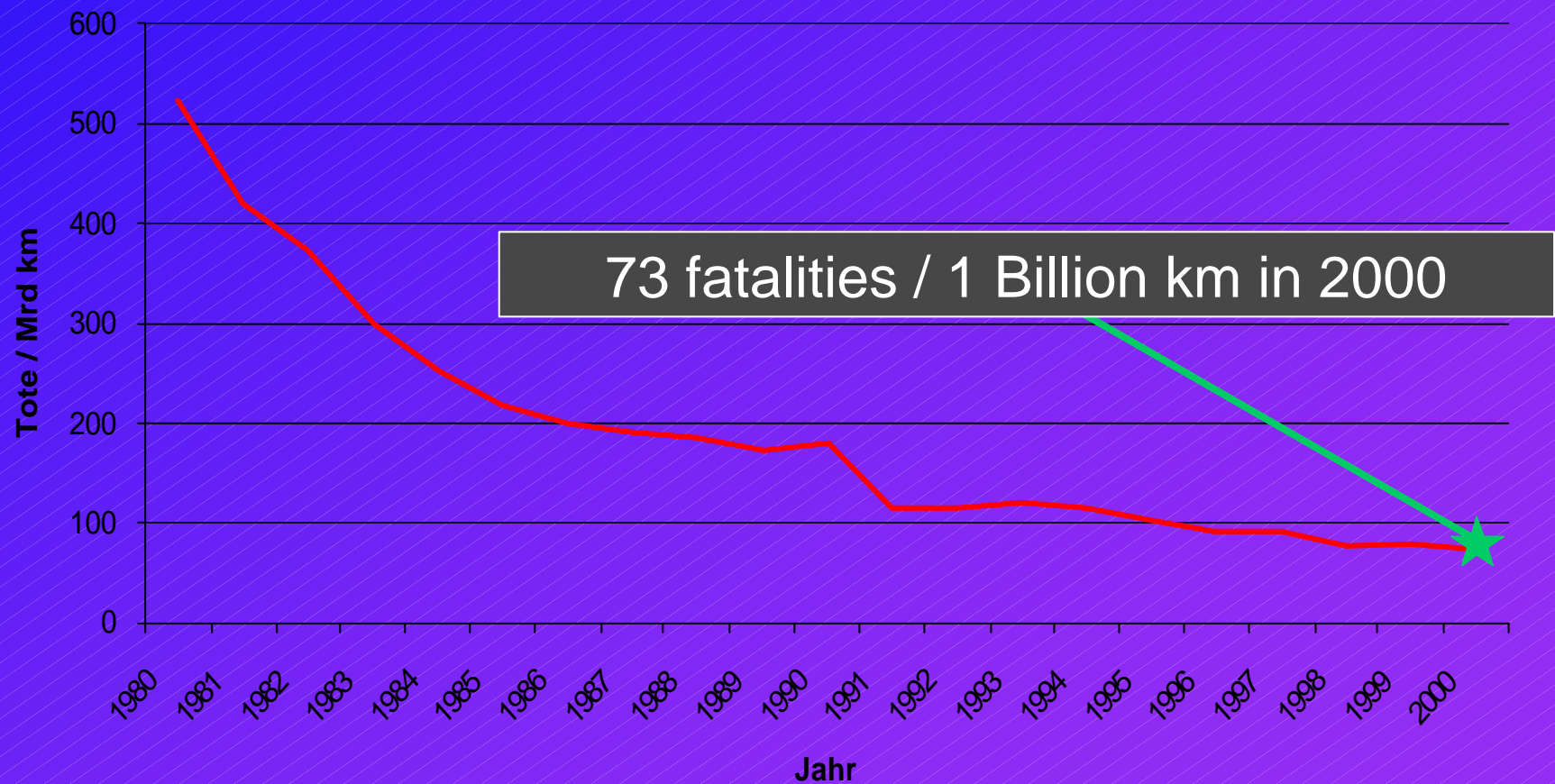


Quelle: Statistisches Bundesamt 2002



# Statistics

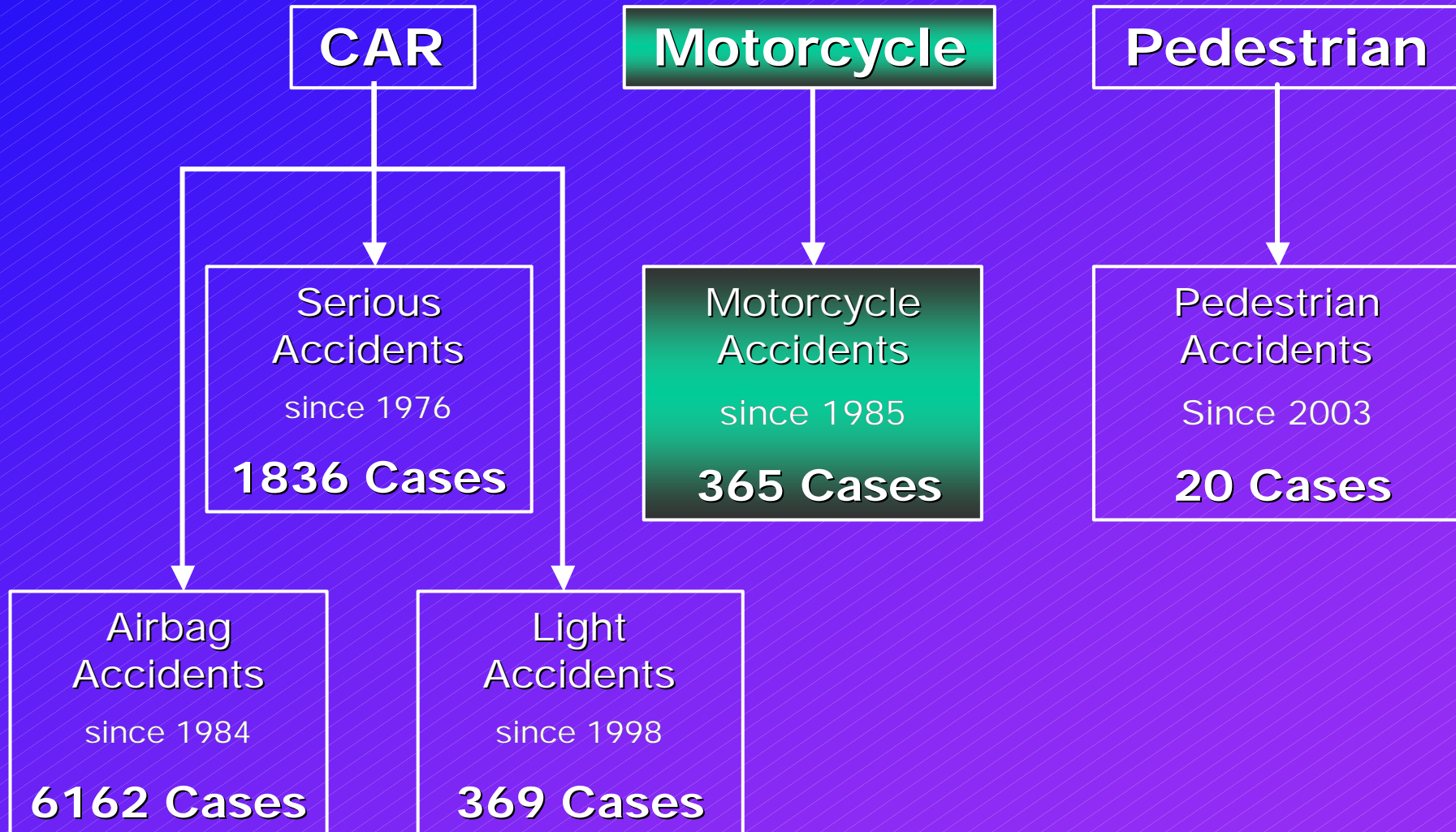
## Killed Motorcycle Riders per 1 Billion km in Germany



Quelle: Statistisches Bundesamt 2001

# Accident Research at BMW

1976 - 2004





# International Accident Research



## GIDAS

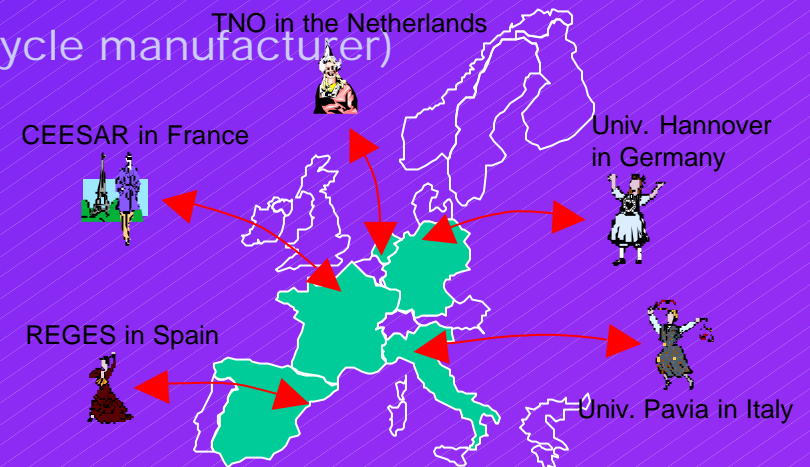
(German In Depth Accident Studie)

- VDA** (**V**erband **D**eutscher **A**utomobilhersteller)
- Region: Hannover, Dresden
- financial support from BMW



(Motorcycle Accident In Depth Studie)

- ACEM** (Organisation of europ. motorcycle manufacturer)
- Region: 5 countries
- Chairman of the MEG  
(**M**otorcycle **E**xpert **G**roup)
- financial support from BMW



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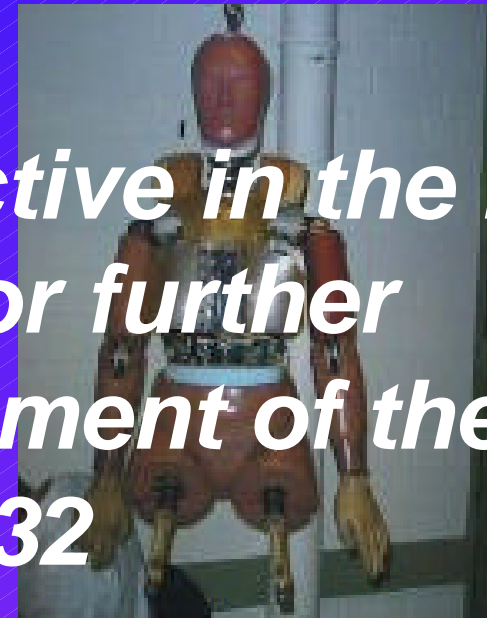




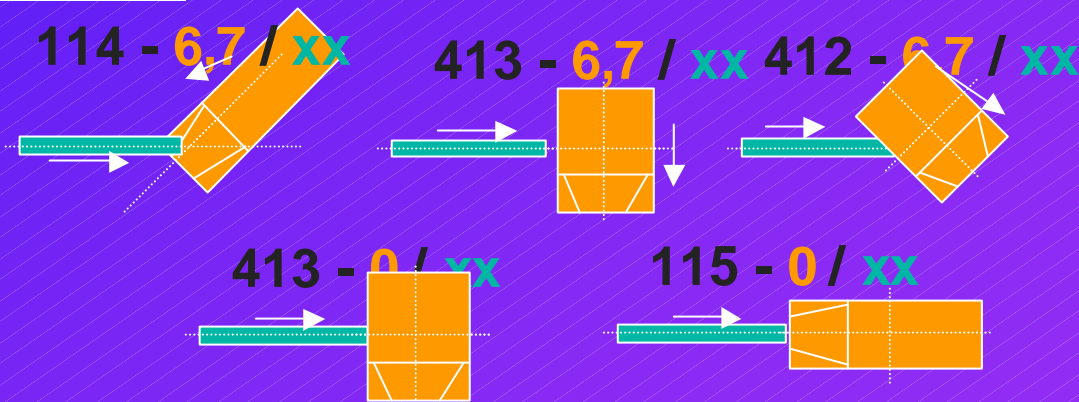
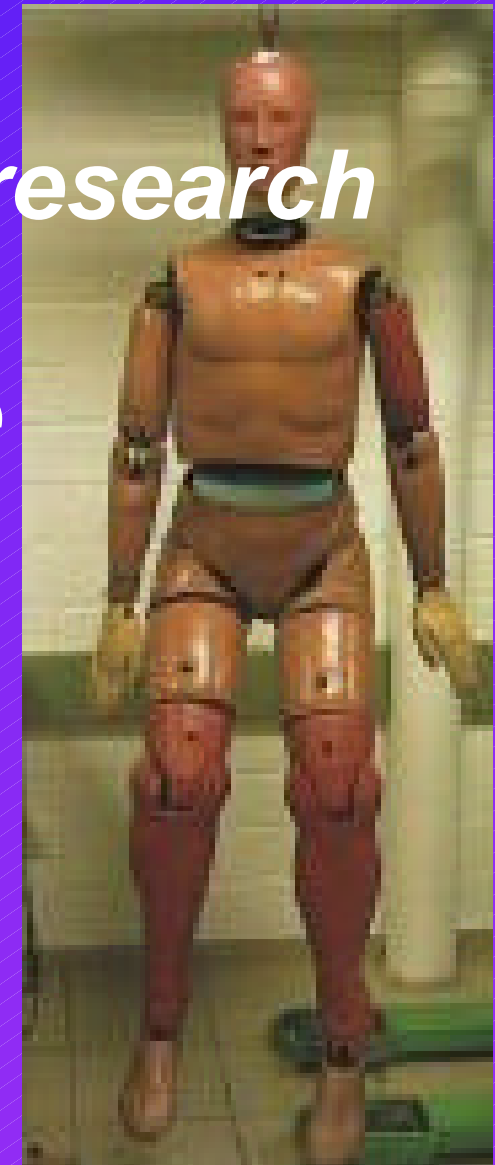
# ISO 13232

## ISO 13232

- Part 1: Definitions, symbols, and general considerations
- Part 2: Definitions of impact conditions in relation to accid. data
- Part 3: MATD
- Part 4: Variables to be measured, instrumentation and measurement procedures
- Part 5: Injury indices and risk benefit anal
- Part 6: PS impact test procedures
- Part 7: Computer Simulation
- Part 8: Documentation and report



*BMW active in the research group for further development of the ISO 13232*



# Agenda

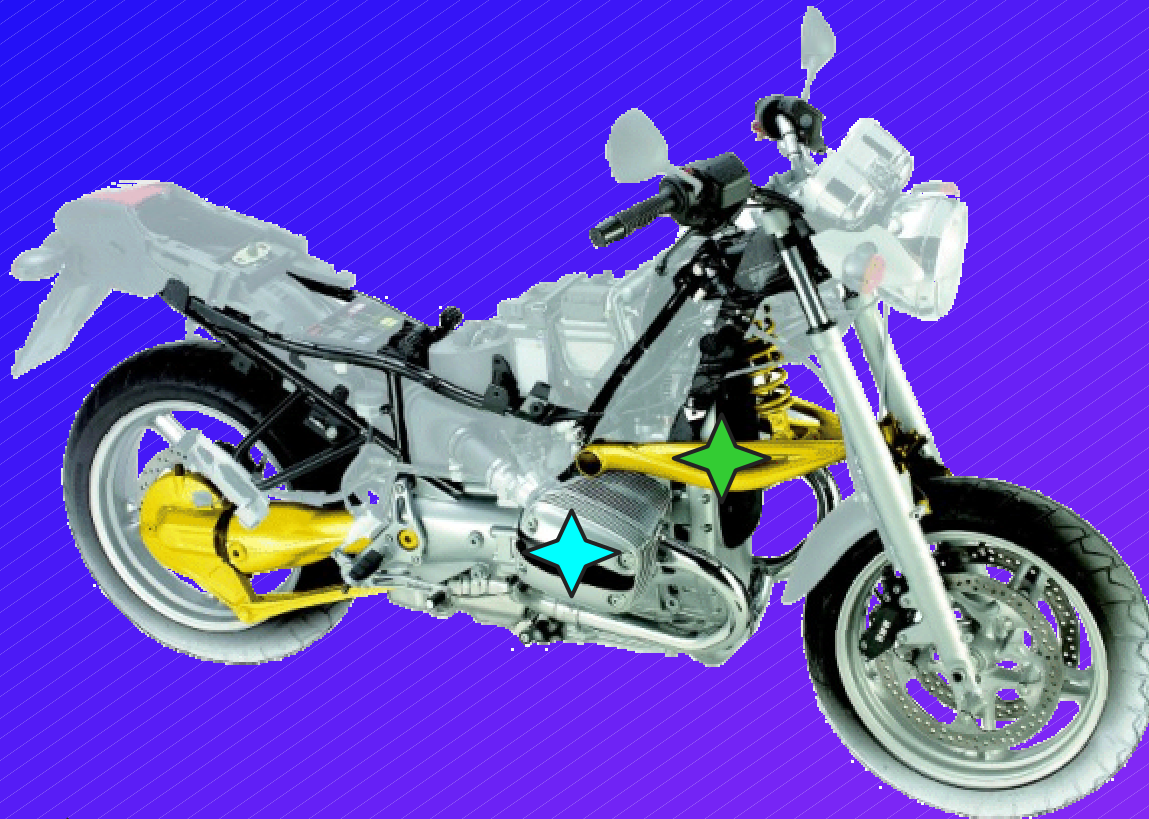
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# Safety elements

## Motorcycle Body / Engine



◆ Boxer engine : **Leg protection in side collision**

◆ Front wheel steering: **marginal nodding while braking**

General : **defined Crash behaviour**, no splinting parts, no sharp edges

# Safety elements

## crash optimized Windshield

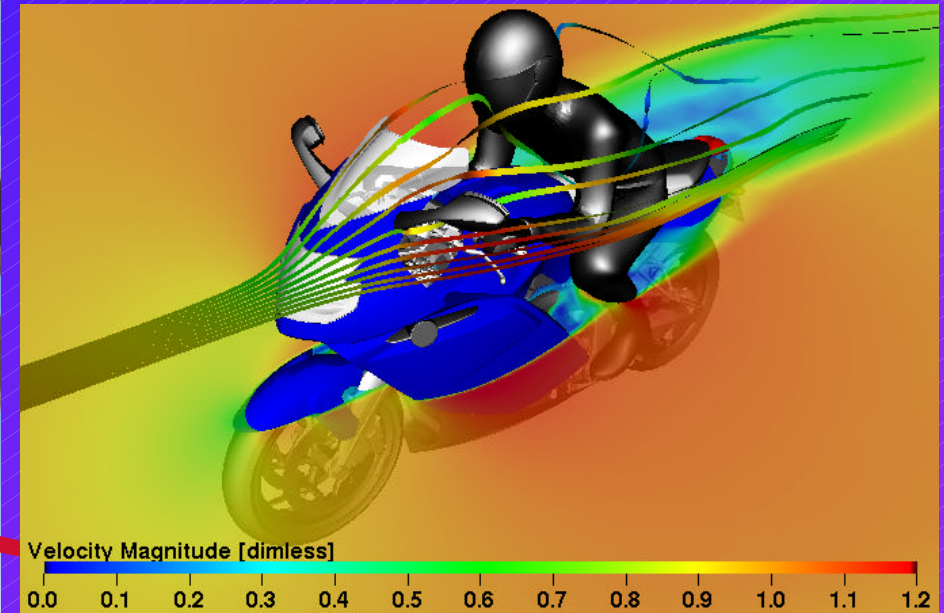


- Releasing mechanism for motorcycle windshield  
⇒ **reduction of injury risk**



# Safety elements

## Windbreak & weather protection



- Reduced hypothermia
- Reduced wetting
- Increased visibility conditions
- ⇒ increased reactivity
- ⇒ less fatigue



# Safety elements

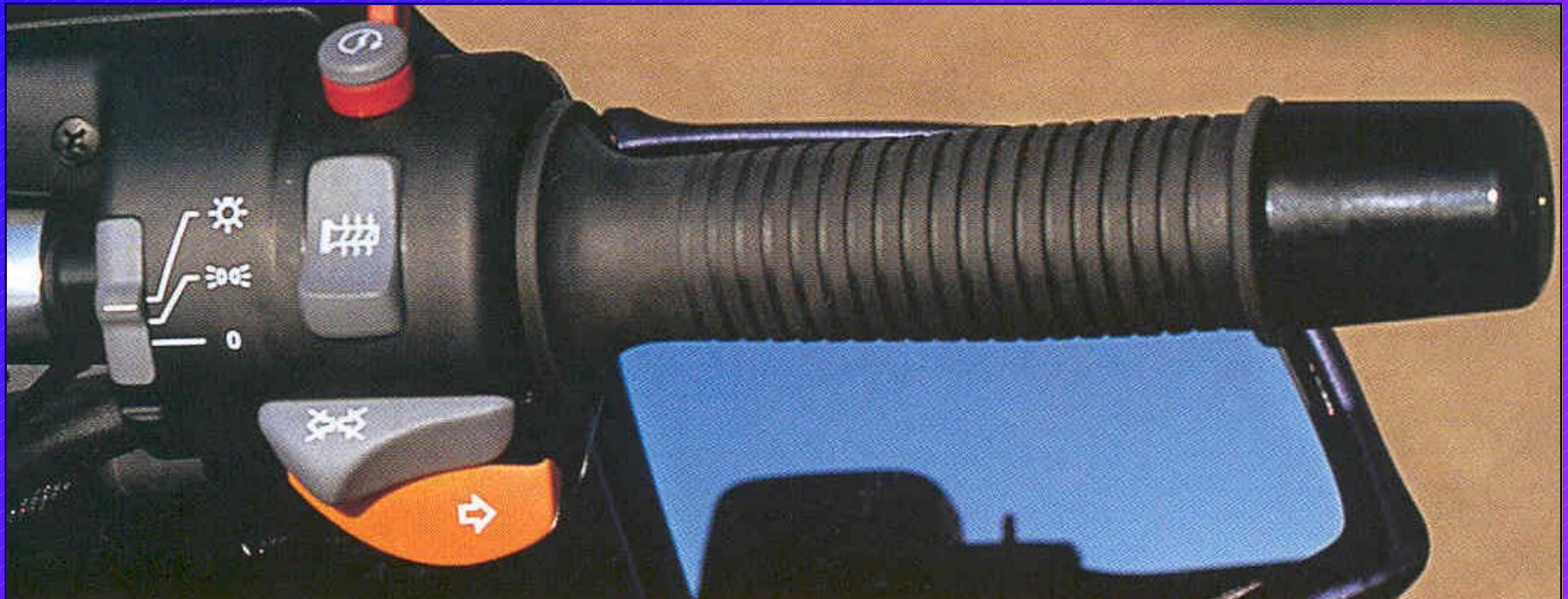
## Ergonomics / Controls



- Intuitive controls
  - No distraction
- ⇒ **Increased reactivity**

# Safety elements

## Heated Handle Bar

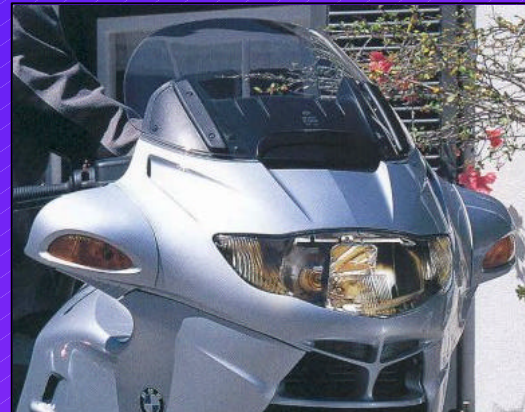


- Reduced hypothermia  
⇒ **Increased reactivity**



# Safety elements

## Conspicuity



- Improved headlight systems  
⇒ **Reduce the risk to be overlooked by car drivers**



# Safety elements

## Ergonomics / comfortable seating



- Comfortable seating even during long tours
  - No fatigue
  - No "bloodless" body parts
- ⇒ **Increased reactivity**